Vol. 8 No. 5

Bulletin
of the
Chicago Academy of Sciences

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A Preliminary Key to the Genera of Clavarioid Fungi

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Chicago
Published by the Academy
1948

The Bulletin of the Chicago Academy of Sciences **was initiated in 1883 and volumes 1 to 4 were published prior to June, 1913. During the following twenty-year period it was not issued. Volumes 1, 2, and 4 contain technical or semi-technical papers on various subjects in the natural sciences. Volume 3 contains museum reports, descriptions of museum exhibits, and announcements.**

Publication of the *Bulletin* was resumed in 1934 with volume 5 in the present format. It is now regarded as an outlet for short to moderate-sized original papers on natural history, in its broad sense, by members of the museum staff, members of the Academy, and for papers by other authors which are based in considerable part upon the collections of the Academy. It is edited by the Director of the Museum with the assistance of a committee from the Board of Scientific Governors. The separate numbers are issued at irregular intervals and distributed to libraries and scientific organizations, and to specialists with whom the Academy maintains exchanges. A reserve is set aside for future need as exchanges and the remainder of the edition offered for sale at a nominal price. When a sufficient number of pages have been printed to form a volume of convenient size, a title page, table of contents, and index are supplied to libraries and institutions which receive the entire series.

Howard K. Gloyd, Director of the Museum

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The fungi to be treated here are basidiomycetes whose fructifications are erect from their substratum and are, in form, simple clubs or more or less branched structures. The hymenium layer covers all the upper surfaces as a rule; though occasionally it is unilateral or the apex of the fructification may be sterile. The substratum may be soil, humus, wood or undecomposed plant debris. There is evidence that some of the species are mycorhizal. While the larger clavarioid fungi are almost all fleshy in the sense that a mushroom is of fleshy consistency, some of the smaller species are tough or woody. Though they are all edible if palatable [2], usually they are not found in sufficient quantities to make them sought for as food

In pursuing a study of the fungi generally allocated to the genus *Clavaria* and to the family Clavariaceae, the present author has been surprised to find only some half dozen species reported from the state of Illinois. In the neighboring tier of states some three to four dozen species are known. Because of situations such as this no attempt is being made at this time to enumerate *species* but to assist individuals who may collect clavarioid fungi tentative keys to the species known to occur in North America have been prepared. These are under constant revision in typewritten or mimeographed form, and so, while it is hoped they are sometimes helpful to their users, they are not yet worthy of publication. However, to promote study of this group, this paper has been prepared as a key to those *genera* one may expect

2 As far as the author knows there is only one report of poisoning by a member of this group. Roger Heim (11) reported, "Clavaria *formosa* n'est pas comestible; il n'exerce aucune action sur l'estomac, mais agit su I'intestine comme un purgatif."

to find in North America. The numbers in parentheses after each generic name in the key refer to the publications in the list at the end of this paper. These so-designated publications deal with the species of that particular genus in North America, and nearly all the recognized species of all but the more obscure genera, such as *Pistillina, are covered* in these references.

Several of the works cited contain keys to the species but none of them has all the species in the genera as differentiated by the following key. Fries

fungi imperfecti now excluded. Some workers contemporary to Fries and many workers since have treated his genus, *Clavaria, as a* number of groups that in themselves seem to merit distinction as separate genera. It is hoped that this synoptic artificial key will indicate more or less the relationships among the genera and yet be useful. Some genera of the Hydnaceae (15) and of the Tremellales (14) are of clavarioid form, but while they are basidiomycetes, they are arbitrarily excluded from this treatise.

KEY TO THE NORTH TEMPERATE GENERA OF CLAVARIOID FUNGI

1 Spores hyaline (rarely tinted), mostly smooth and thin-walled; basidia 2- or 4-spored:

2 Fructifications lamellate — Sparassis (17).

2/ Fructifications not lamellate:

3 Spores large (7 microns or over), globose; basidia 2-spored; hymenium white or gray; not staining green with $FeSO_4$:

4 Fleshy putrescent throughout; no distinct stem portion — *Clavulina* (5, 6, 8, 17).

4/ Toughish to woody, at least below; with a distinct stem portion — LACHNOCLAVULINA section of *Clavulina* (5, 6, 8).

3/ Spores distinctly smaller than above or ellipsoid; basidia typically 4-spored if spores spherical; hymenium often colored otherwise or staining green with $FeSO_4$:

5 With stout hyphae in the trama producing setae or gloeocystidia in the hymenium or subhymenium, or the apices of branches truncate or cup-shaped; spores under 8 microns long; not staining green with $FeSO_4$:

6/ Apices of some branches truncate to cup-shaped; with gloeocystidia in the hymenium layer — *Clavicorona (9).*

6 Apices of branches acute; with strong setae in the hymenium or subhymenium — *Eriocladus (4).*

5/ Without such hyphae or apices; spores various; or staining green with $FeSO_4$:

7 Fructifications branched:

8 Finely branched (often under 1 mm.); toughish *Pterula (13).*

8/Branches larger; flesh fragile or putrescent:

9 Hymenium green with $FeSO_4$ *Clavariella p. p.* (5, 6, 8, 17).

9/ Hymenium not green with $FeSO_4$ *Clavaria p. p.* (5, 6, 8, 17).

7/Fructifications simple or rarely branched once above:

10 Fructifications enlarged above or over 1 cm. in diameter above; spores elliptic:

11 Minute (not over 5 mm. tall); or with an abruptly inflated head; not green with $FeSO_4$:

12 With an inflated down-turned head *Physalacria* (1, 2).

12' With the apex merely enlarged:

13 Hymenium on the expanded blunt apex *Pistillina (17).*

13' Hymenium on the sides of the club *Pistillaria p. p.* (17, 5).

11/Large (over 2 *cm. tall);* or turning green with $FeSO_4$ *Clavariadelphus* (5, 6. 8, 17).

10/Fructifications not enlarged above (i. e., slenderly clavate to filiform clubs); spores various:

14 Fructifications over 2 cm. tall; not obviously restricted to specific hosts or substrata, or the fructifications fascicled fleshy forms; often with globose spores:

15 Tramal hyphae with many secondary crosswalls; damp connections rare *Clavaria p. p.* (5, 6, 8, 17).

15/ Tramal hyphae with secondary crosswalls only rarely; clamp connections on most crosswalls Clavulinopsis (5, 6, 8, 17).

14/ Fructifications smaller; restricted to specific hosts or substrata which may be sclerotia or living organisms; spores elliptical or flattened on one side:

16 Algal "symbionts," narrowly clavate; mostly on rather bare soil; without a sclerotial base *Gliocoryne* (6, 7, 8).

16/ Not algal "symbionts," filiform or under 2 mm. tall; mostly on dead plant materials:

17 With a sclerotial base; stipe slender and distinct; mostly over 5 mm. tall *Typhula (18).*

17/ Without a sclerotial base; stipe not distinct; mostly less than 2 mm. *tall Pistillaria p. p.* (6, 17).

1/ Spores typically ochraceous, mostly roughened or obdurate-walled [4]; basidia 4-spored, rarely otherwise:

18 Toughish to woody; spores echinate or sharply warty; hymenium sometimes unilateral; not becoming green with $FeSO_4$:

19 Coarse, leathery to woody fungi; hymenium often unilateral or branches flattened *Thelephora (12).*

19/ Delicate, toughish to woody fungi; hymenium covering all surfaces of the rounded branches *Scytinopogon (19).*

18/ Fleshy; spores smooth, verrucose to echinulate; hyenium on all lateral surfaces of the branches; becoming green with $FeSO_4$:

20 Simple unbranched fungi with broadened sterile apices; sometimes "mushroom-like" in form

Gomphus p. p. (3, 6, 8, 16, 17)

20/ branched fungi; "coralloid" in form

Clavariella p. p. (5, 6, 8, 17).

4In practice, Clavarioid fungi with spores which under the microscope display walls of appreciable (more than 0.5 microns) thickness, obvious ornamentation or color are placed here.

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